

1028714
PCTWORLD INTELLECTUAL PROPERTY ORGANIZATION
International Bureau

INTERNATIONAL APPLICATION PUBLISHED UNDER THE PATENT COOPERATION TREATY (PCT)

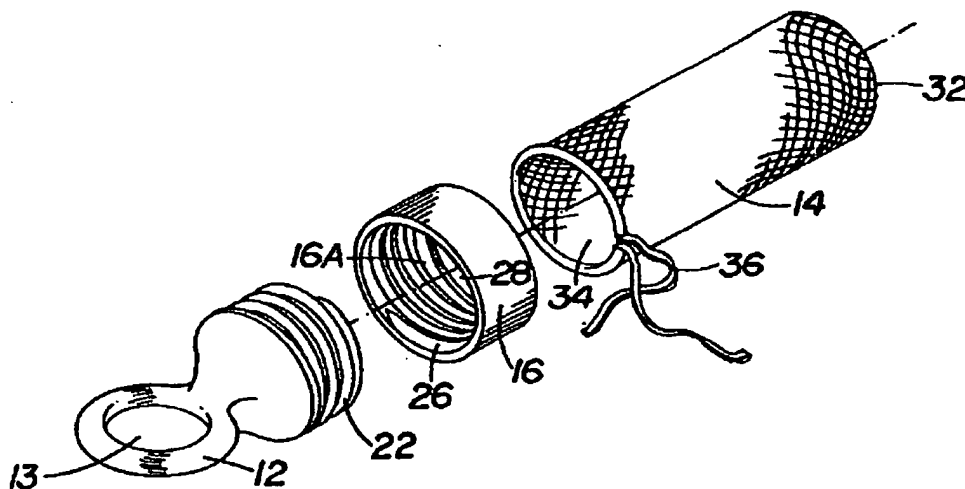
(51) International Patent Classification ⁶ : A47G 19/22	A1	(11) International Publication Number: WO 95/09554 (43) International Publication Date: 13 April 1995 (13.04.95)
(21) International Application Number: PCT/US94/11135 (22) International Filing Date: 30 September 1994 (30.09.94) (30) Priority Data: 08/130,763 4 October 1993 (04.10.93) US (71)(72) Applicant and Inventor: BERRY, Donald, P., Sr. [US/US]; 391 Magnolia Place, DeBary, FL 32713 (US). (74) Agent: RENFRO, Julian, C.; 665 Randy Lane, Winter Park, FL 32789 (US).		(81) Designated States: CA, JP, European patent (AT, BE, CH, DE, DK, ES, FR, GB, GR, IE, IT, LU, MC, NL, PT, SE). Published With international search report. Before the expiration of the time limit for amending the claims and to be republished in the event of the receipt of amendments.

(54) Title: DEVICE FOR SUPPLYING FOOD TO A PERSON

(57) Abstract

A device for feeding a young child without the threat of choking comprising a handle (12) having a circular end (22) upon which a threaded ring (16) equipped with a circularly-shaped aperture (28) is utilized. A food dispensing container (14) of fine mesh material having an aperture (34) therein is adapted to be placed upon the circular end of the handle, with the ring (16) being used to tightly secure the end of the container (14) to the handle. Solid or semi-solid food is intended to be inserted into the aperture (34), so that the food can

safely dissolve in the mouth of the person being fed. Upon food being inserted into the container (14) and the container then being tightly secured to the handle by the ring (16), the person to be fed is able to hold the handle while the container of food is residing in the person's mouth.



FOR THE PURPOSES OF INFORMATION ONLY

Codes used to identify States party to the PCT on the front pages of pamphlets publishing international applications under the PCT.

AT	Austria	GB	United Kingdom	MR	Mauritania
AU	Australia	GE	Georgia	MW	Malawi
BB	Barbados	GN	Guinea	NE	Niger
BE	Belgium	GR	Greece	NL	Netherlands
BF	Burkina Faso	HU	Hungary	NO	Norway
BG	Bulgaria	IE	Ireland	NZ	New Zealand
BJ	Benin	IT	Italy	PL	Poland
BR	Brazil	JP	Japan	PT	Portugal
BY	Belarus	KE	Kenya	RO	Romania
CA	Canada	KG	Kyrgyzstan	RU	Russian Federation
CF	Central African Republic	KP	Democratic People's Republic of Korea	SD	Sudan
CG	Congo	KR	Republic of Korea	SE	Sweden
CH	Switzerland	KZ	Kazakhstan	SI	Slovenia
CI	Côte d'Ivoire	LI	Liechtenstein	SK	Slovakia
CM	Cameroon	LK	Sri Lanka	SN	Senegal
CN	China	LU	Luxembourg	TD	Chad
CS	Czechoslovakia	LV	Latvia	TG	Togo
CZ	Czech Republic	MC	Monaco	TJ	Tajikistan
DE	Germany	MD	Republic of Moldova	TT	Trinidad and Tobago
DK	Denmark	MG	Madagascar	UA	Ukraine
ES	Spain	ML	Mali	US	United States of America
FI	Finland	MN	Mongolia	UZ	Uzbekistan
FR	France			VN	Viet Nam
GA	Gabon				

WO 95/09554

PCT/US94/11135

RECEIVED
CENTRAL FAX CENTER

MAY 17 2010

DEVICE FOR SUPPLYING FOOD TO A PERSON

Relationship to Previous Documentation

This invention bears a close relationship to the document entitled "Baby Safe Feeder" filed in the U.S. Patent and Trademark Office on June 25, 1993 in connection with the Disclosure Document Program. This became Disclosure Document No. 334,203.

Background Art

Almost everyone is well aware of the fact that liquid food can be supplied to a child from a bottle provided with a nipple, with such nipple often being held in place by virtue of mounting the nipple in a ring that is equipped with internal screw threads. Used with this nipple and ring is a bottle having external threads extending around the open end, so that by tightly screwing the ring onto the top of the bottle, a liquid tight arrangement is brought about. After the milk, orange juice or other liquid food has been fully administered, the ring is unscrewed from the top of the bottle so that a thorough washing of all of these components can be readily brought about.

Typically the mother or other care giver introduces the infant to spoon feeding in the age range of six to eight months, but sometimes the transition from nipple to spoon can be difficult for the infant.

One of the objects of this invention, therefore, is to provide a means whereby a transitional phase is set up during the baby's development between the milk-nipple stage and the food-spoon stage. The administering of certain foods, such as semi-solid foods, in the early period of

WO 95/09554

PCT/US94/11135

-2-

development becomes easier because of the baby's familiarity with a nipple, and this makes subsequent spoon training faster and easier, because when a spoon is first presented with food in it, the baby will already be familiar with the food. Consequently, crossing the "spoon barrier" becomes a simple matter.

Another important consideration is the fact that when an infant is starting to take semi-solid and solid food, the possibility of choking can be a constant threat. Therefore, when a child is being given a piece of a hot dog, for example, the mother or other care giver should cut the hot dog longitudinally before cutting it into pieces. This is advisable because a generally cylindrically shaped piece of hot dog is of a configuration that could easily form a blockage in the throat of a child or impaired adult, and cause him or her to choke to death if help is not quickly forthcoming.

I am aware that there are many items on the market, such as baby crackers, baby cookies, baby toast and the like that are intended as snacks for an infant to chew on while teething or while the infant has only a few teeth. Even though such items are ostensibly for infants, it is nevertheless quite possible for an infant or impaired adult to break off a piece of such an item and choke on it.

It was in an effort to supplement and improve upon previously known feeding practices that the present invention was evolved.

Disclosure of Invention

In accordance with this invention, I provide a device for feeding food, typically semi-solid food, to a young child or to a person unable to manage the use of a fork or spoon, without the threat of the person choking. In other words, my invention is usable in the nursery, or in a location involving the administration of food by a care

WO 95/09554

PCT/US94/11135

-3-

giver to a child, or to an adult with a physical or mental impairment.

My novel device comprises a handle member in combination with a food dispensing member, with the handle member having a generally circularly configured end thereon. Around this circular end of the handle member, ring mounting means are disposed, so that a ring capable of securing the food dispensing member in a desired operative position can be tightly fastened upon the handle member. I prefer to utilize external screw threads on the handle member, and to provide internal threads around the interior of the ring.

The internally threaded ring utilized in combination with the handle member has a generally circularly-shaped aperture therein. When the internal threads of the ring have threadedly engaged the external threads disposed around the circular end of the handle member, a flange disposed around the interior of the ring is brought into firm contact with a circular part of the handle, thereby to hold the food dispensing member tightly against the handle member.

The food dispensing member I prefer to utilize is typically in the form of an elongate container of fine mesh material, with one end of the container open, and the other end closed. This elongate container is adapted to receive therein, food of such a nature as to be dissolved in the mouth, thus enabling liquified food to pass through the fine mesh material of the container, and be ingested by the person. The open end of the container is of a size that can be readily accommodated in the generally circularly-shaped aperture of the ring as well as being able to fit over the threaded end of the handle member. Therefore, upon a suitable food item being placed in the container and the open end of the container placed over the threaded end of the handle member, the ring can be tightened upon the threads disposed around the end of the handle member while bearing against the end of the container, thus to form a unitary device that can be held by the child or impaired adult in such a manner that the closed end of the food

WO 95/09554

PCT/US94/11135

-4-

dispensing member or container can be placed in the person's mouth.

Examples of solid or semi-solid food that can be readily dissolved in the mouth of the person are pieces of bread, small pieces of cooked potato, pretzel pieces, jello, certain cereals, cookie crumbs and rock candy. Further examples are carrots, apples, cooked or raw food and the like.

I typically construct the handle member of plastic, preferably a strong, industrial grade plastic, although I am not to be limited to this. Usually I create the mesh container out of suitable cloth, and in accordance with one embodiment of this invention, I may utilize a draw string around the open end of the container as a safety feature. Upon the open end of the container being placed around the threaded end of the handle member and the internally threaded ring tightened, the draw string can then be pulled tight and tied to the handle, making it highly unlikely that the elongate food container could become separated from the handle member, even if the ring should somehow become unscrewed.

As an additional step taken to make sure that the elongate container or food dispensing member is tightly gripped, I may utilize an internally threaded ring around whose interior a flange is located, which flange can be brought into tight contact with a circular, dome-shaped portion of the handle member, thus to tightly grip the end of the food dispensing member.

It is thus to be seen that a primary object of this invention is to provide a feeding device for safely feeding an infant, small child or impaired adult without the danger of such person choking on the food.

It is another object of this invention to provide a feeding device of simple and straight-forward configuration, that can be manufactured and marketed at a relatively low cost, yet forming an entirely safe feeding arrangement for a child or impaired adult.

WO 95/09554

PCT/US94/11135

-5-

It is yet another object of this invention to provide a food dispensing member of fine mesh construction such that relatively soft, solid or semi-solid food items placed in the dispensing member can be dissolved by the person's saliva and thereafter ingested, this being accomplished without any possibility of the person choking upon such food.

It is yet still another object of this invention to provide a means for tightly securing a food dispensing member of fine mesh construction upon a handle member, such that a child or impaired adult can readily learn to put the food dispensing member in his or her mouth and ingest the food value from the solid or semi-solid food placed in the dispensing member, without risking the danger of the person choking.

It is yet another object of this invention to provide a multi-component feeding device that can be easily assembled when ready to be put into use, but which can be readily disassembled for sterilization subsequent to use.

It is yet still another object of this invention to provide a multi-component feeding device utilizing a food dispensing member of safe yet inexpensive construction, such that this member can be discarded immediately after use.

These and other objects, features and advantages will become more apparent from a study of the appended figures of drawing.

Brief Description of Drawings

Figure 1 is an assembled view of my novel safe feeder, by the use of which readily dissolved food can be safely administered to an infant, small child or impaired adult;

Figure 2 is an exploded view of my baby safe feeder, revealing the separate components that constitute this invention, which are the handle member, the threaded ring able to engage the male threads disposed around one end of the handle member, and the food dispensing member, with this

WO 95/09554

PCT/US94/11135

-6-

embodiment of the food dispensing member utilizing a drawstring, and with these several components being utilized in combination in order to form a safe feeding device;

Figure 2A is an exploded view of two of the components that constitute my feeder device, this view revealing that the handle member has a domed end, and that the threaded ring has an internal flange;

Figure 2B is a view revealing that the internal flange of the threaded ring makes tight contact with a circular portion of the domed end, thus to tightly grip the elongate food-containing member;

Figure 3 is a perspective view of a second embodiment of the food dispensing member in accordance with my invention, wherein a plastic loop is substituted for the drawstring previously utilized in the end of the food dispensing member in order to prevent disengagement of the food dispensing member from the threaded ring;

Figure 3A is a fragmentary view, to a larger scale, of the end of the food dispensing member, wherein stitches are utilized for securing the loop in the end of the food dispensing member; and

Figure 3B is a fragmentary view similar to Figure 3A and illustrating the use of adhesive for securing the loop in the end of the food dispensing member.

Detailed Description

With initial reference to Figure 1, it will be seen that I have illustrated my safe feeding device 10 in its fully operative position, such that readily dissolved food may be administered to a child or impaired adult without the threat of choking. The device 10 comprises a handle member 12 in combination with a food dispensing member 14. The food dispensing member 14 is firmly fastened to the handle member 12 by the use of an encircling ring 16 whose construction will be described at further length hereinafter.

WO 95/09554

PCT/US94/11135

-7-

Visible in Figure 1 as well as in Figure 2 is the handle member 12, which is typically of plastic, preferably of a strong, industrial grade plastic that can resist being brought to sterilization temperatures for a large number of times without significantly deteriorating. The handle 12 may be provided with an aperture 13.

In Figure 2 it is important to note that the handle member 12 has a generally circularly configured end 20 thereon, around which circular end, ring mounting means are disposed. As will be noted, I prefer for the ring mounting means to take the form of external screw threads 22 on the circular end of the handle member.

Also visible in Figure 2 as well as in Figure 2A is the ring 16, the interior of which is equipped with internal means such that it can be tightly interfitted upon the ring mounting means of the handle member 12. I prefer for the internal means of the ring member to take the form of internal threads 26 that are created so as to threadedly engage the threads 22 at the end 20 of the handle member 12. The ring 16 has a generally circularly-shaped aperture 28 therein, the diameter of which is determined by the flange 16A that extends around one end of the ring.

Additionally depicted in Figure 2 is the food dispensing member 14, which can be seen to be an elongate container of fine mesh material having a closed end 32, but having an open end 34. The member 14 may be of cloth, such as nylon or polyester, although certain closely woven plastic meshes may also be utilized in certain circumstances.

The open end or aperture 34 of the food dispensing member is of a diameter such that it can fit through the aperture 28 of the ring 16 and still be received upon the threads 22 or other ring mounting means utilized on the end of the handle member 12. In accordance with a first embodiment of the food dispensing member, I may utilize a securing means in the form of a draw string 36 operatively

WO 95/09554

PCT/US94/11135

-8-

disposed around the open end 34, so that after the open end has been placed around the threaded end 20 of the handle 12 and the ring 16 tightened, the draw string 36 can be pulled tight and thereafter tied to the handle. This will assure that the elongate container of fine mesh material will not be separated from the handle 12 in the unlikely event that the ring 16 becomes loosened.

I am not limited to any particular size of the elongate food dispensing member 14, but the length of this member or container is typically two or three times as great as its diameter.

As will be obvious, the length of the effective portion of the elongate food dispensing member can be readily adjusted by the care giver making a decision of how much of the food dispensing member 14 is pulled over the circular end of the handle member 12 before the ring 16 is tightly secured thereto.

As can be easily seen, readily dissolved food items may be inserted into the container 14 through the open end 34 thereof, with such food items being in the nature of pieces of bread, pieces of cookie, potato, pieces of pretzel, jello and other solid or semi-solid foods. Upon the person, whether infant or impaired adult, placing the closed end of the food dispensing member 14 in his or her mouth, such person can commence receiving nutrition shortly after the food items become saturated with his or her saliva. The mesh is of fine enough weave as to assure no large particles coming through that would pose a choking-type jeopardy to the person.

After the person removes the feeding device or falls asleep, the mother or other care giver can remove the feeding device and then proceed to unfasten the ring 16 so that any remaining pieces of food in the food dispensing member can be removed either by shaking, or by turning the food dispensing member 14 inside out. Thereafter all of the

WO 95/09554

PCT/US94/11135

-9-

components 12, 14 and 16 can be sterilized for subsequent use.

Some food dispensing members may be of relatively permanent construction, such as of nylon or polyester, and in that instance the food dispensing member can be reused after sterilization. On the other hand, other food dispensing members of inexpensive construction, such as of cotton mesh, can be discarded immediately after use.

As is obvious, the size of the mesh opening of the food dispensing member utilized in a given instance can be chosen with regard to the physical size and health of the person involved. Typically, a relatively small mesh would be utilized with an infant, whereas a larger mesh could be utilized by a care giver when feeding an adult with a physical or mental impairment.

Some embodiments of the mesh utilized in accordance with my invention have involved something on the order of twelve openings per lineal inch, whereas other embodiments have had approximately eighteen openings per lineal inch. Stated in terms of openings per square inch, these can range between 144 openings and 324 openings per square inch.

From an inspection of Figure 2A, it can be seen that I have revealed that the threaded end of the handle member 12 is provided with a domed portion 12A, with the aforementioned threads 22 being disposed in a surrounding relationship to the domed portion 12A. Also to be noted in Figure 2A is the fact that the aperture 28 in the internally threaded ring 16 is determined by the size of the flange 16A. I deliberately size the flange 16A of the ring member such that the circumferential portion representing the innermost part of the ring is in tight contact with a circularly-shaped lower part of the domed portion 12A at such time as the ring 16 is tightly screwed upon the handle member 12.

With reference now to Figure 2B, it will be seen that the circumferential portion representing the innermost part

WO 95/09354

PCT/US94/11135

-10-

of the flange 16A makes tight contact with the largest diameter portion of the dome-shaped portion 12A when the ring 16 has been tightly secured to the handle member 12. One reason for this construction is that I wish for the food dispensing member 14 to be tightly gripped at such time as the threaded ring 16 has been tightened securely upon the handle member, so that the person being fed cannot easily pull the food dispensing member away from the handle member. Another reason is that the tightly fitting relationship between the flange 16A and the dome-shaped portion helps to seal out the food from getting down between the external threads 22 of the handle member, and the internal threads 26 of the ring 16.

It is obvious that I am not to be limited to the use of a drawstring 36 for preventing the end of the food dispensing member 14 from becoming separated from the handle member 12 should the threaded ring 16 somehow becoming loosened, for as illustrated in Figures 3, 3A and 3B, I may utilize an embodiment of this invention in which a loop or circle member 40 is incorporated into the end of the food dispensing member 14, to serve as a securing means. The loop or circle member 40 is typically of industrial grade plastic or the like, and by its outer diameter being larger than the aperture 28 of the internally threaded ring 16, it serves protect against the food dispensing member 14 moving out of contact with the threaded ring member 16 during the time my device is being utilized for feeding an infant or an impaired adult.

As illustrated in Figure 3, the loop 40 is typically in close contact with the ring 16 at such time as a food item, such as a slice of apple 42, has been placed in the food dispensing member 14, the closed end 32 of the food dispensing member inserted through the aperture in the ring 16, and then the ring 16 tightened against the external threads of the handle member 12 in order to effectively

WO 95/09554

PCT/US94/11135

-11-

prevent the open end of the food dispensing member from becoming dislodged from the handle member 12.

The loop or circle member 40 may be secured in the open end or aperture 34 of the food dispensing member 14 by the use of stitches 44, as shown in Figure 3A, or as an alternative, the loop or circle member 40 may be secured in the open end of the food dispensing member by the use of an appropriate cement, or by stapling, as shown at 46 in Figure 3B.

Other embodiments within the spirit of my invention will be obvious to those skilled in this art, and I am not to be limited except as required by the scope of the appended claims.

WO 95/09554

PCT/US94/11135

-12-

I Claim:

1. A device for feeding a young child or impaired adult without the threat of the person choking, said device comprising a handle member (12) in combination with a food dispensing member (14), said handle member having a generally circularly configured end (20) thereon, upon which circular end, ring mounting means (22) are disposed, a ring (16) utilized with said handle member, the inner surface of said ring being equipped with internal means (26) for being tightly interfitted with said ring mounting means, said ring having a circularly-shaped aperture therein (28), said internal means (26) on said ring (16) being configured to operably engage said ring mounting means (22) disposed around said circular end of said handle member (12), said food dispensing member (14) being in the form of an elongate container of fine mesh material having an open end (34) therein through which semi-solid food can be inserted, with such food intended to at least partially dissolve in the mouth of the person, said open end (34) of said container (14) being of a size that can be readily accommodated in said circularly-shaped aperture (28) of said ring (16) as well as being able to fit over said ring mounting means (22) of said handle member, whereby upon food being placed in said container (14) and the open end (34) of said container placed over said ring mounting means (22), said ring (16) can be tightened upon said handle member (12) so as to form a unitary device that can be held by the person and said container placed in the mouth of the person.

2. The device for feeding a young child or impaired adult without the threat of the person choking as recited in Claim 1 in which said handle member (12) has a dome-shaped portion (12A) surrounded by said ring mounting means (22), and said ring (16) has an inwardly extending flange (16A) coming into tight contact with a part of said dome-shaped portion (12A) at such time as said container (14) has been

WO 95/09554

PCT/US94/11135

-13-

placed over said dome-shaped portion (12A) and said ring (16) tightened, said tight contact assuring that said container will be tightly gripped.

3. The device for feeding a young child or impaired adult without the threat of the person choking as recited in Claim 1 in which securing means are provided around said open end (34) of said container, for preventing said container (14) from pulling away from said ring (16) during a feeding procedure.

4. The device for feeding a young child or impaired adult without the threat of the person choking as recited in Claim 3 in which said securing means is a draw string (36).

5. The device for feeding a young child or impaired adult without the threat of the person choking as recited in Claim 3 in which said securing means is loop (40) made integral with the end (34) of the container (14).

6. The device for feeding a young child or impaired adult without the threat of the person choking as defined in Claim 1 in which said container (14) is made of a cloth mesh.

7. The device for feeding a young child or impaired adult without the threat of the person choking as defined in Claim 1 in which said container (14) is made of a plastic mesh.

WO 95/09554

PCT/US94/11135

-14-

8. The device for feeding a young child or impaired adult without the threat of the person choking as defined in Claim 1 in which the length of said container (14) is more than twice as great as the diameter of said container.

9. The device for feeding a young child or impaired adult without the threat of the person choking as recited in Claim 1 in which a care giver can determine the length of said container by a suitable adjustment of how much of said container (14) is placed over said ring mounting means (22) of said handle member (12) before said ring (16) is tightened.

10. The device for feeding a young child or impaired adult without the threat of the person choking as defined in Claim 1 in which said handle member (12) is of unitary construction and made of plastic.

11. A device for feeding a young child or impaired adult without the threat of the person choking, said device comprising a handle member (12) in combination with a food dispensing member (14), said handle member having a generally circularly configured end (20) thereon, around which circular end, external screw threads (22) are disposed, a ring (16) utilized with said handle member, said ring being equipped with internal threads (26) and having a generally circularly-shaped aperture (28) therein, said internal threads of said ring being configured to threadedly engage the external threads (22) disposed around said circular end of said handle member (12), said food dispensing member (14) being in the form of an elongate container of fine mesh material closed at one end, but with the other end open, said container being adapted to receive therein, food intended to at least partially dissolve in the mouth of the person, the open end (34) of said container (14) being of a size that can be readily accommodated in said generally circularly-shaped aperture (28) of said ring

WO 95/09554

PCT/US94/11135

-15-

as well as being able to fit over the threaded end (22) of said handle member (12), whereby upon solid or semi-solid food being placed in said container (14) and the open end (34) of said container placed over said threaded end (22) of said handle member (12), said ring (16) can be tightened upon the threads disposed around the end of the handle member so as to form a unitary device that can be held by the person and the closed end of said container placed in the mouth of the person.

12. The device for feeding a young child or impaired adult without the threat of the person choking as recited in Claim 11 in which said handle member (12) has a dome-shaped portion (12A) surrounded by said external screw threads (22), and said ring (16) has an inwardly extending flange (16A) coming into tight contact with a part of said dome-shaped portion (12A) at such time as said container (14) has been placed over said dome-shaped portion and said ring (16) tightened, said tight contact assuring that said container will be tightly gripped.

13. The device for feeding a young child or impaired adult without the threat of the person choking as recited in Claim 11 in which a securing means is provided around said open end (34) of said container, for preventing said container (14) from pulling away from said ring (16) during a feeding procedure.

14. The device for feeding a young child or impaired adult without the threat of the person choking as recited in Claim 13 in which said securing means is a draw string (36).

15. The device for feeding a young child or impaired adult without the threat of the person choking as recited in Claim 13 in which said securing means is a loop (40) made integral with the end (34) of the container (14).

WO 95/09554

PCT/US94/11135

-16-

16. The device for feeding a young child or impaired adult without the threat of the person choking as defined in Claim 11 in which said container (14) is made of a cloth mesh.

17. The device for feeding a young child or impaired adult without the threat of the person choking as defined in Claim 11 in which said container (14) is made of a plastic mesh.

18. The device for feeding a young child or impaired adult without the threat of the person choking as defined in Claim 11 in which the length of said container (14) is more than twice as great as the diameter of said container.

19. The device for feeding a young child or impaired adult without the threat of the person choking as recited in Claim 11 in which a care giver can determine the length of said container by a suitable adjustment of how much of said container (14) is placed over said threaded end (22) of said handle member (12) before said ring (16) is tightened.

20. The device for feeding a young child or impaired adult without the threat of the person choking as defined in Claim 11 in which said handle member (12) is of unitary construction and made of plastic.

WO 95/09554

PCT/US94/11135

1/1

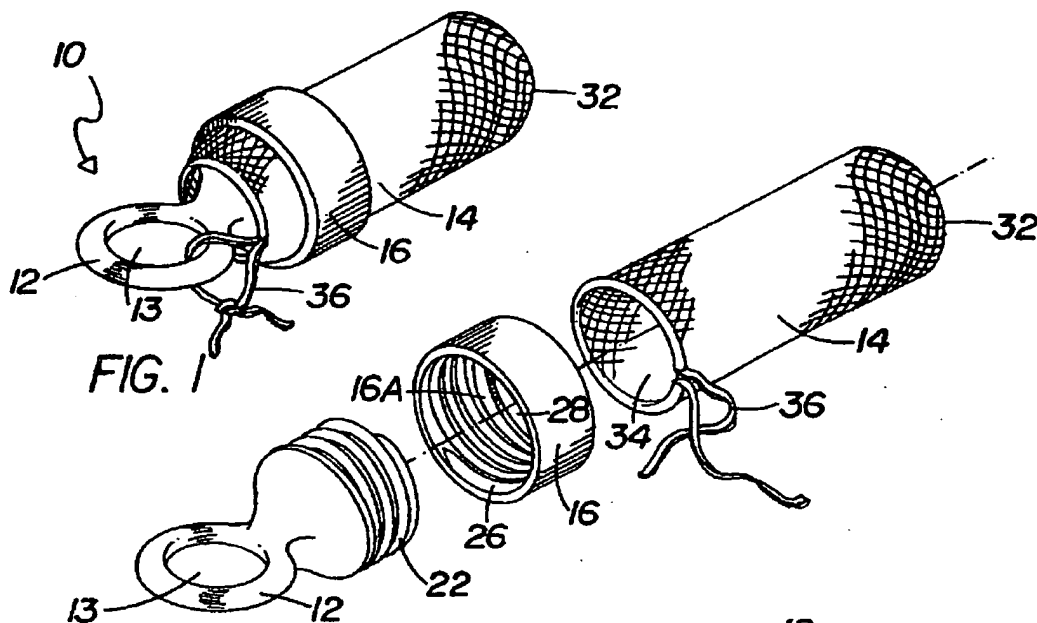


FIG. 1

FIG. 2

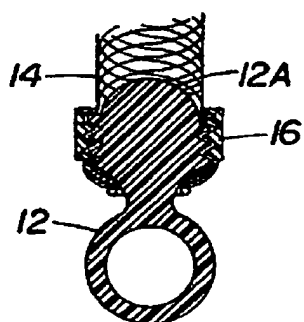


FIG. 2B

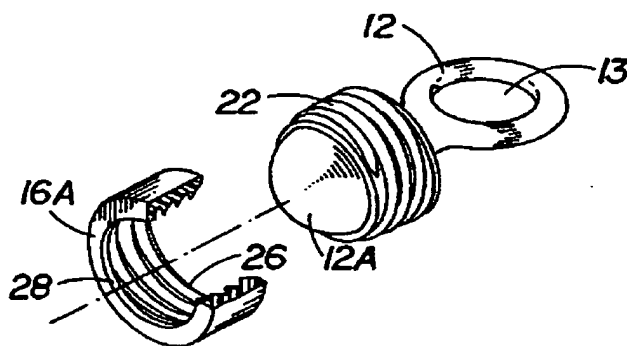


FIG. 2A

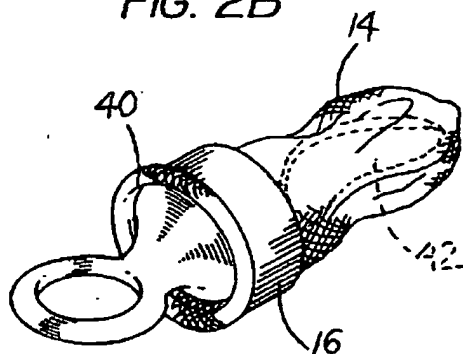


FIG. 3

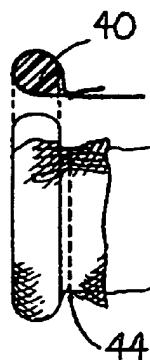


FIG. 3A

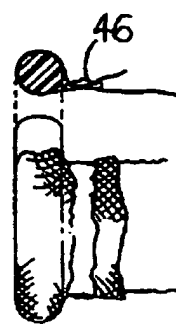


FIG. 3B

MAY 17 2010

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US94/11135

A. CLASSIFICATION OF SUBJECT MATTER		
IPC(6) :A47G 19/22 US CL :604/77 According to International Patent Classification (IPC) or to both national classification and IPC		
B. FIELDS SEARCHED		
Minimum documentation searched (classification system followed by classification symbols) U.S. : 604/19, 54, 57, 77-79, 82, 92, 264, 890.1; 606/235-236		
Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched NONE		
Electronic data base consulted during the international search (name of data base and, where practicable, search terms used) NONE		
C. DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 5,123,915, (MILLER ET AL.), 23 June 1992. See entire document.	1-20
X	US, A, 3,076,574, (C. R. WOODBURY, JR.), 05 February 1963. See entire patent.	1-20
X	US, A, 1,095,264, (J. S. BRIDGES), 05 May 1914. See entire patent.	1-20
X	US, A, 5,078,734, (NOBLE), 07 January 1992. See entire patent.	1-20
X	US, A, 4,192,307, (BAER), 11 March 1980. See entire patent.	1-20
X	US, A, 3,610,248, (SAMUEL L. DAVIDSON), 05 October 1971. See entire patent.	1-20
<input checked="" type="checkbox"/> Further documents are listed in the continuation of Box C. <input type="checkbox"/> See patent family annex.		
* Special categories of cited documents: "A" document defining the general state of the art which is not considered to be part of particular relevance "E" earlier document published on or after the international filing date "L" document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reasons (as specified) "O" document referring to an oral disclosure, use, exhibition or other means "P" document published prior to the international filing date but later than the priority date claimed "T" later document published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention "X" document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone "Y" document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art "A" document member of the same patent family		
Date of the actual completion of the international search 08 DECEMBER 1994		Date of mailing of the international search report 09 FEB 1995
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230		Authorized officer MANUEL MENDEZ Telephone No. (703) 308-2221

Form PCT/ISA/210 (second sheet)(July 1992)*

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US94/11135

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT		
Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
X	US, A, 5,176,705, (NOBLE), 05 January 1993. See entire patent.	1-20

Form PCT/ISA/210 (continuation of second sheet)(July 1992)*